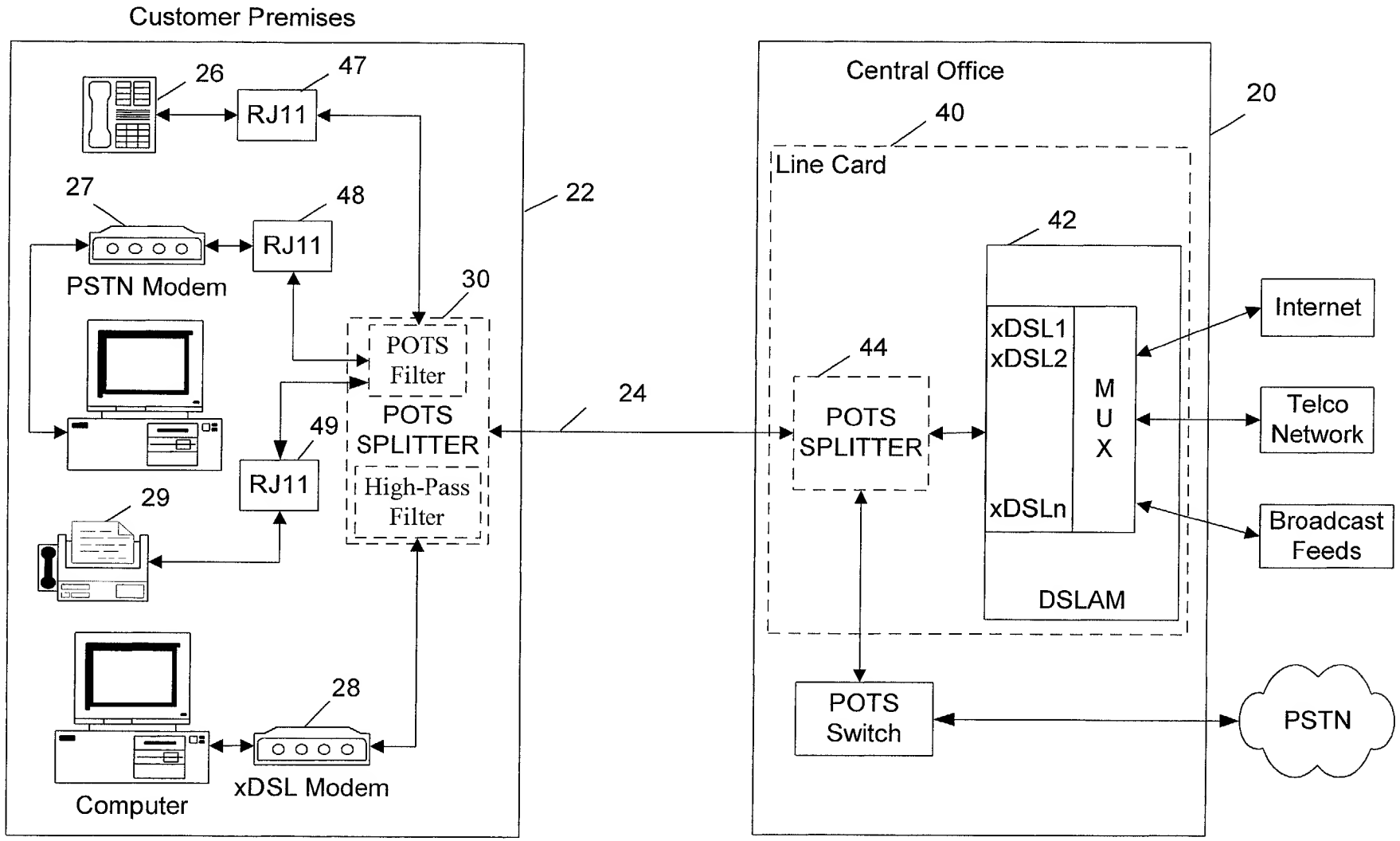

FIG. 1 (Prior Art)

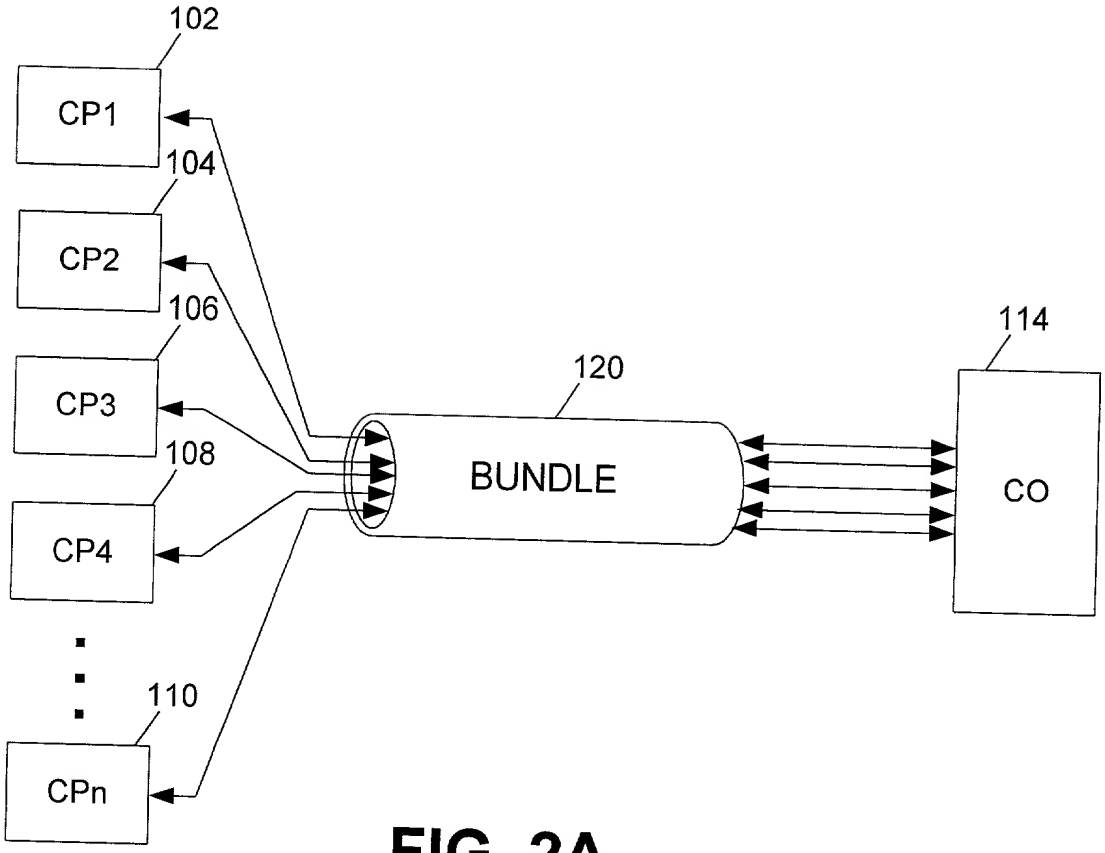
102
CP1
104
CP2
106
CP3
108
CP4
110
CPn
120
BUNDLE
114
CO

FIG. 2A

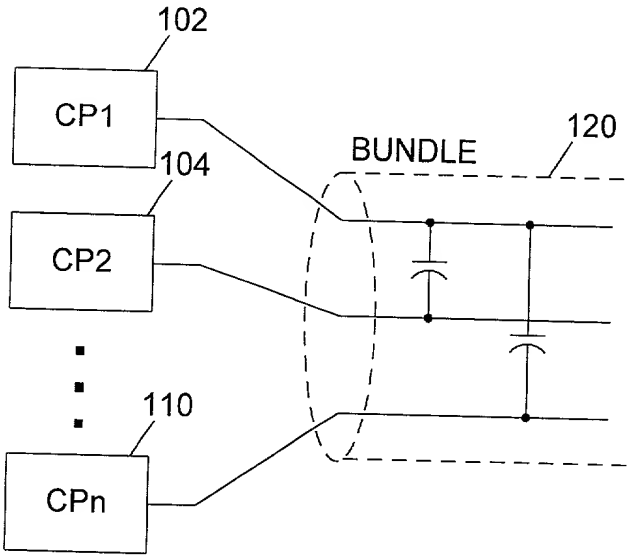
102
CP1
104
CP2
110
CPn
BUNDLE
120

FIG. 2B

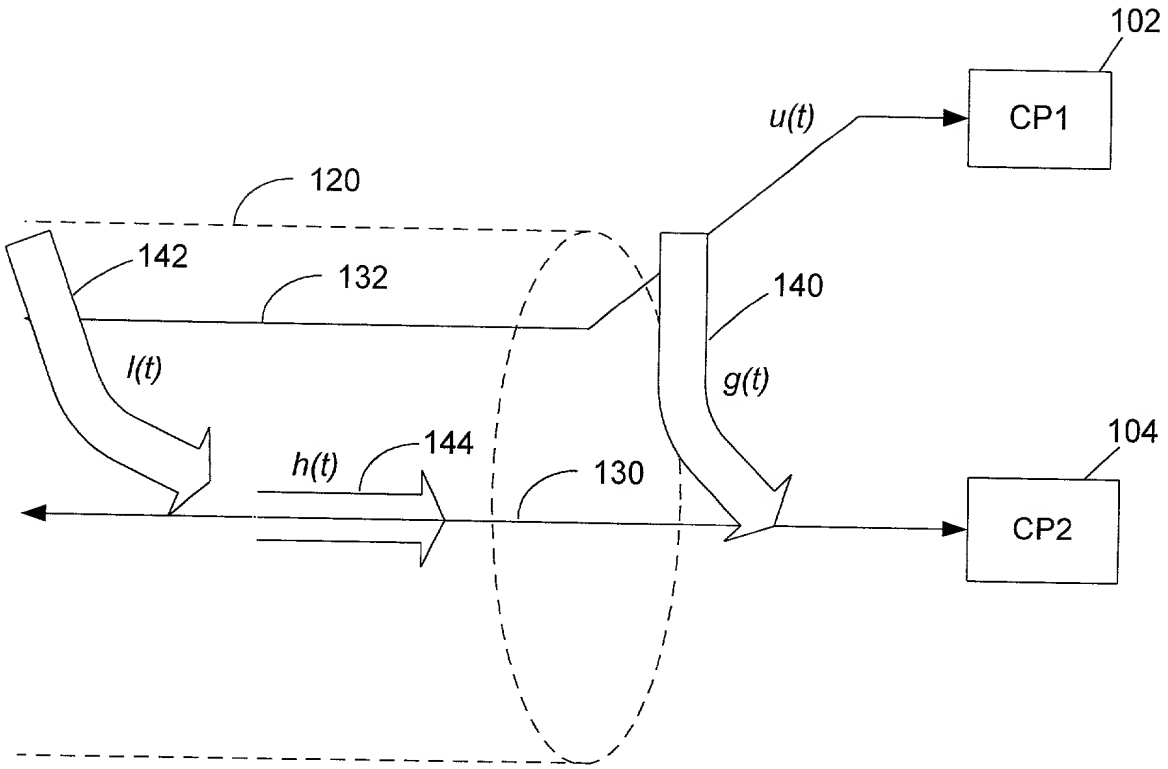
102
CP1
u(t)
120
142
132
140
l(t)
g(t)
104
h(t)
144
130
CP2

FIG. 3A

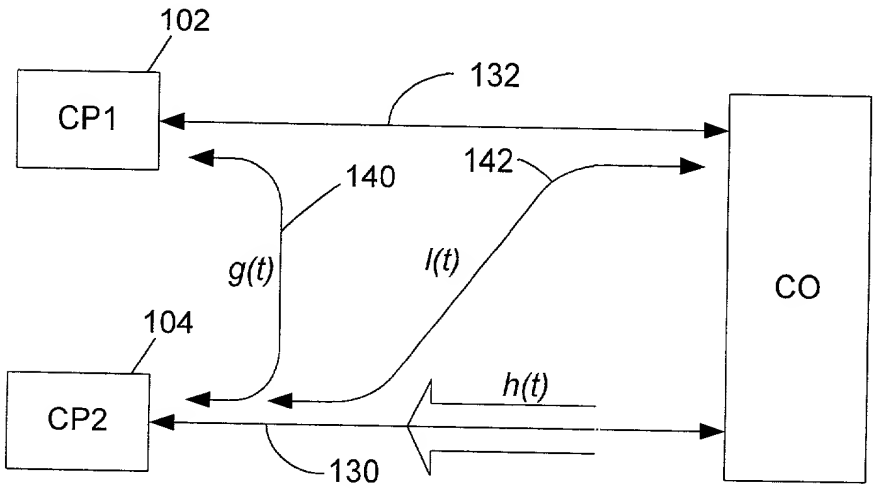
102
CP1
132
140
142
g(t)
l(t)
CO
104
h(t)
CP2
130

FIG. 3B

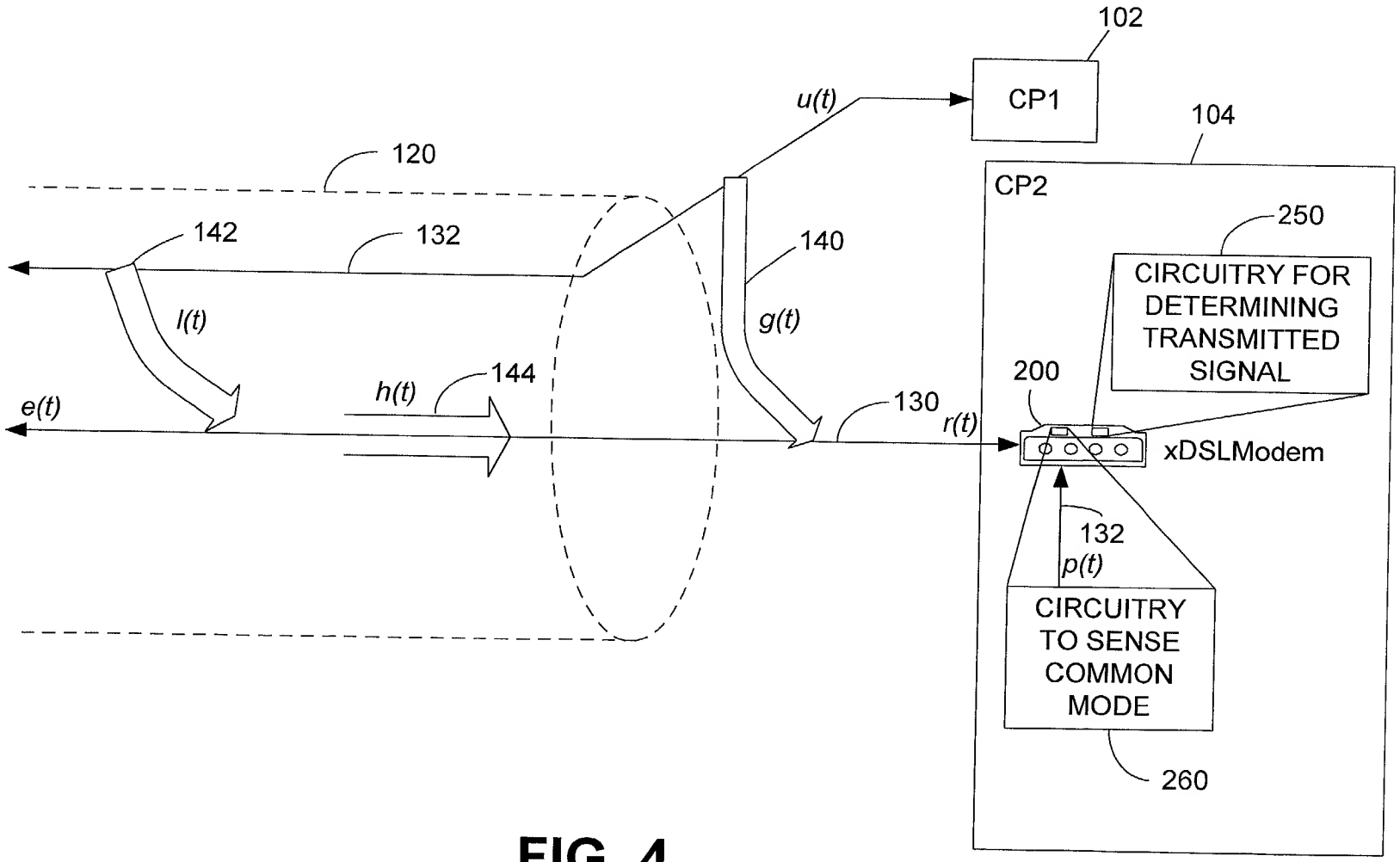
102
CP1
u(t)
104
CP2
120
142
132
140
250
CIRCUITRY FOR DETERMINING TRANSMITTED SIGNAL
l(t)
g(t)
200
e(t)
h(t)
144
130
r(t)
xDSLModem
132
p(t)
CIRCUITRY TO SENSE COMMON MODE
260

FIG. 4

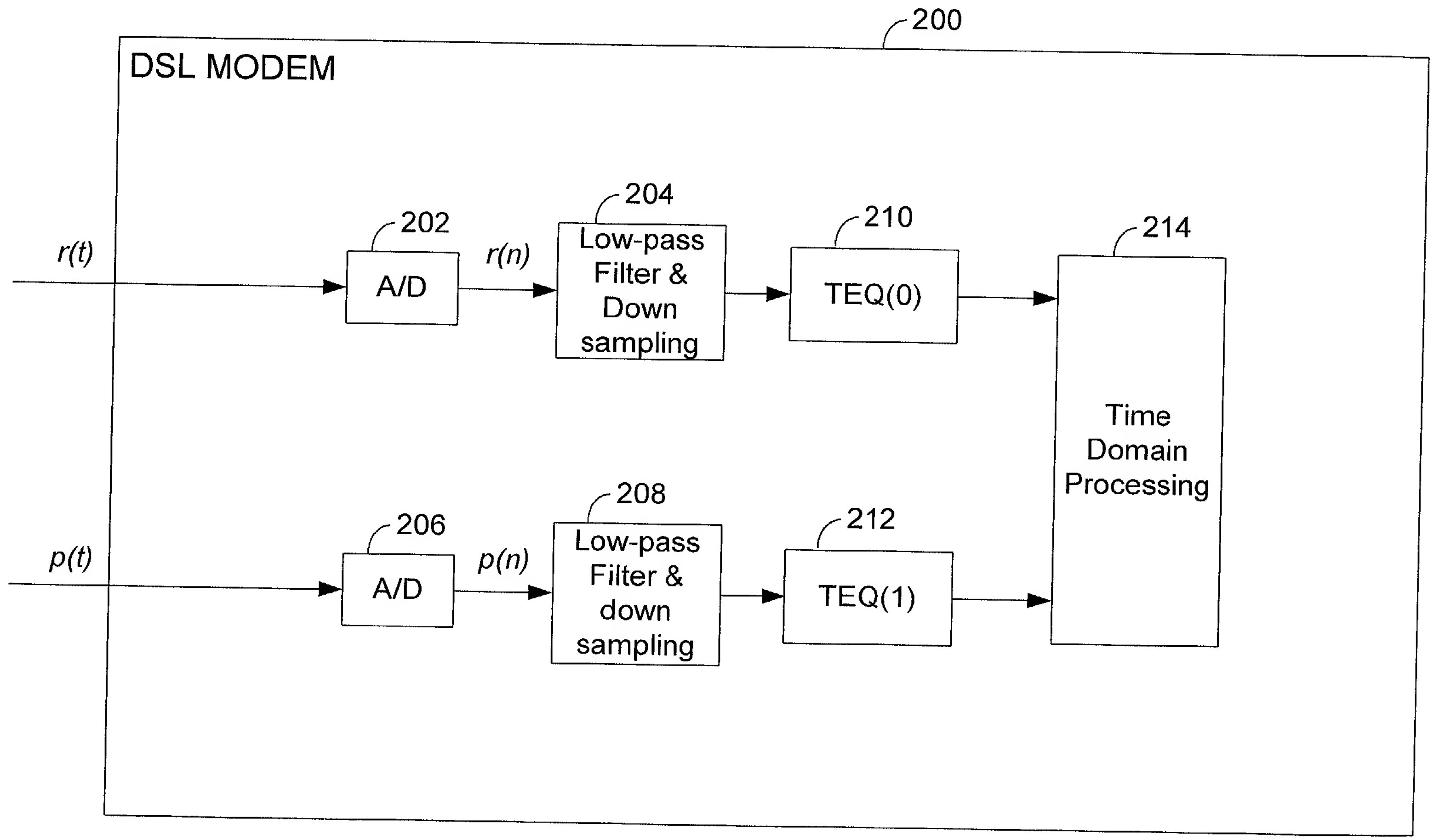
200
DSL MODEM
r(t)
p(t)
202
A/D
r(n)
204
Low-pass Filter & Down sampling
210
TEQ(0)
214
Time Domain Processing
206
A/D
p(n)
208
Low-pass Filter & down sampling
212
TEQ(1)

FIG. 5

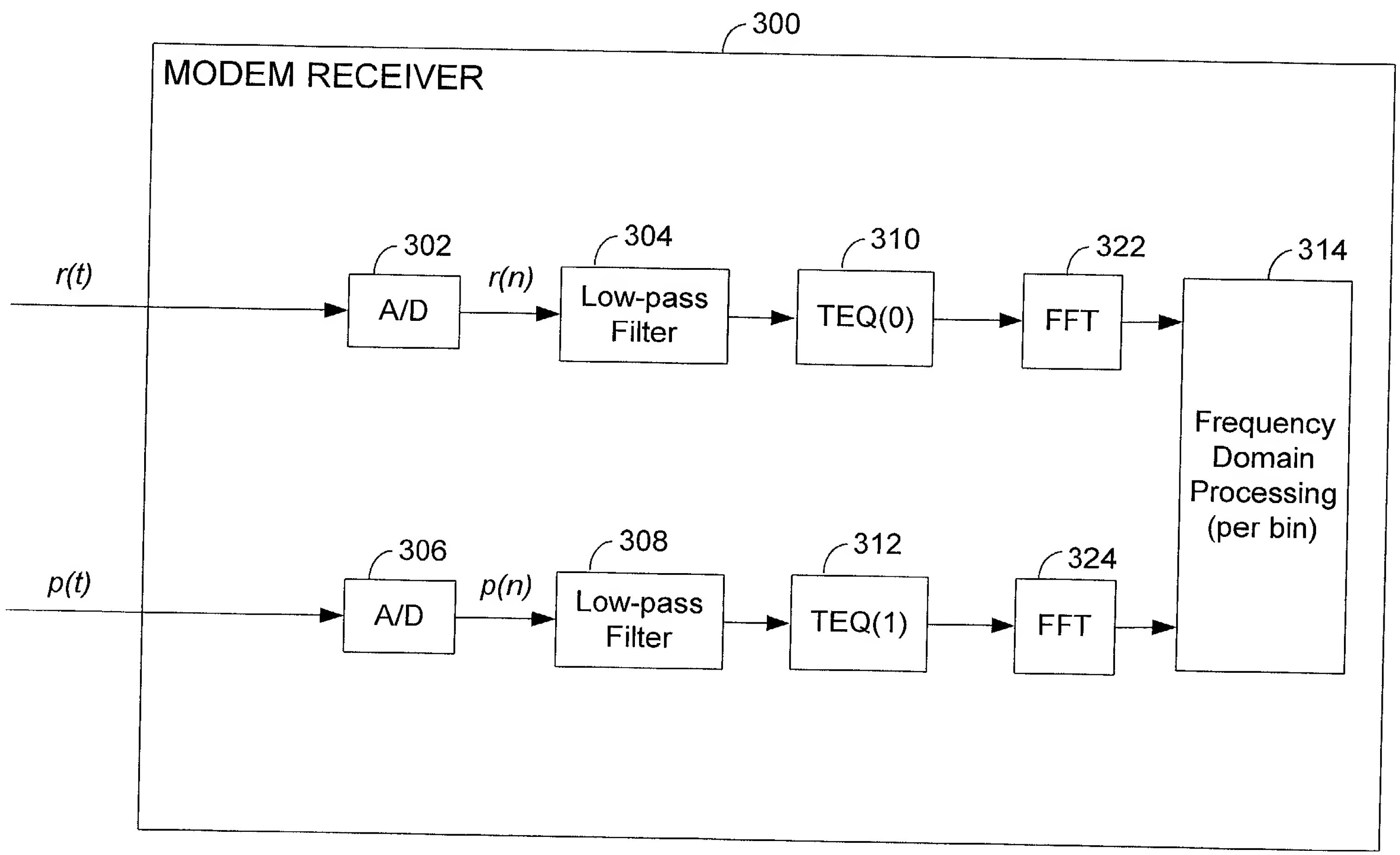
300
MODEM RECEIVER
r(t)
302
A/D
r(n)
304
Low-pass Filter
310
TEQ(0)
322
FFT
314
Frequency Domain Processing (per bin)
p(t)
306
A/D
p(n)
308
Low-pass Filter
312
TEQ(1)
324
FFT

FIG. 6

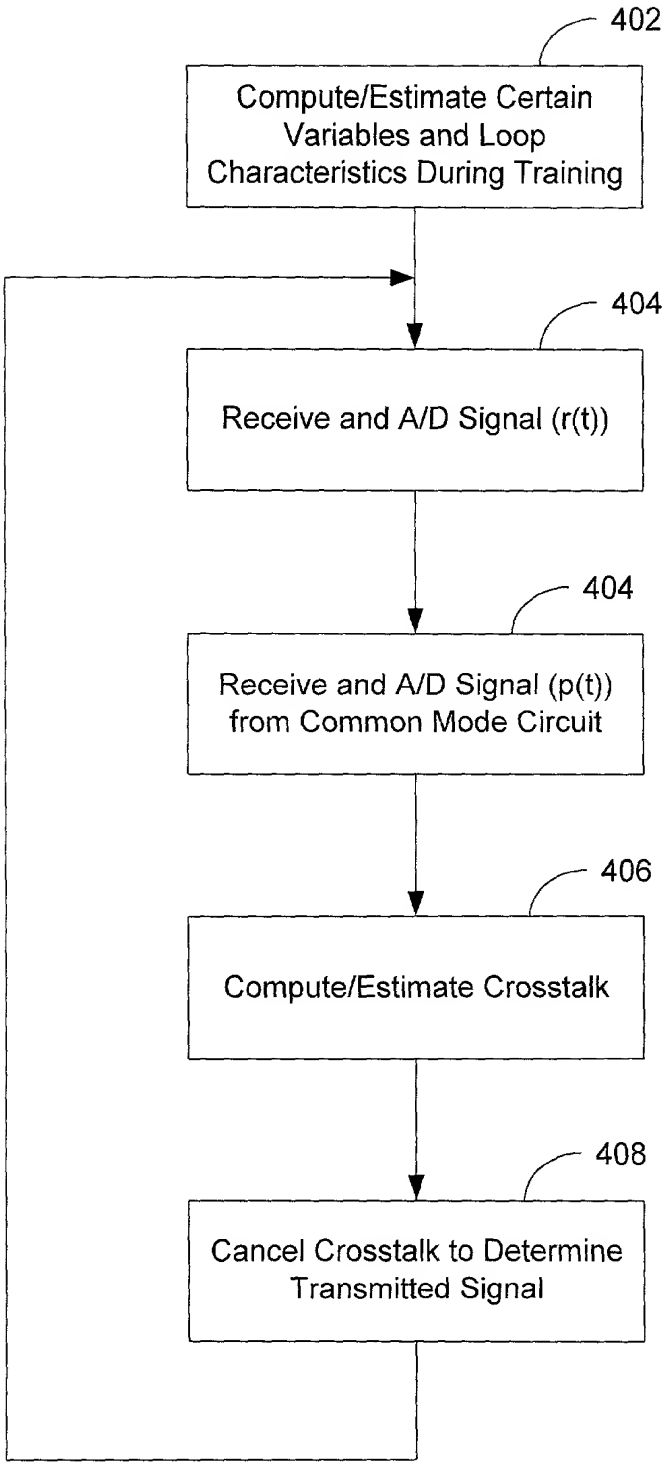
402
Compute/Estimate Certain Variables and Loop Characteristics During Training
404
Receive and A/D Signal (r(t))
404
Receive and A/D Signal (p(t)) from Common Mode Circuit
406
Compute/Estimate Crosstalk
408
Cancel Crosstalk to Determine Transmitted Signal

FIG. 7

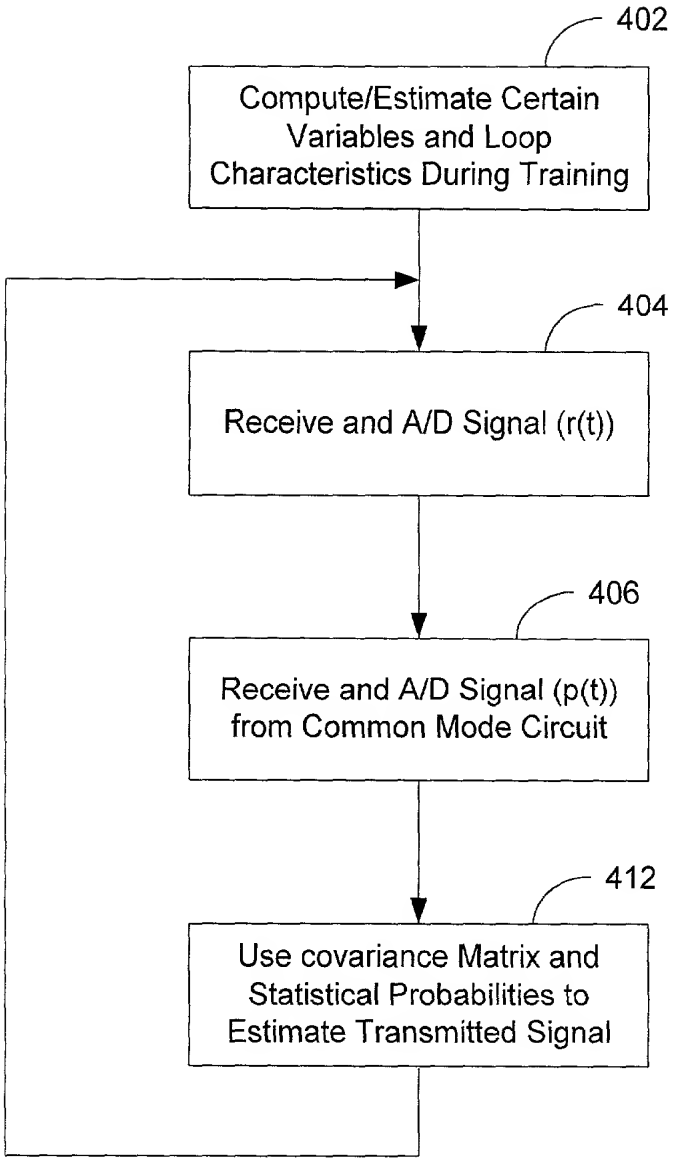
402
Compute/Estimate Certain Variables and Loop Characteristics During Training
404
Receive and A/D Signal (r(t))
406
Receive and A/D Signal (p(t)) from Common Mode Circuit
412
Use covariance Matrix and Statistical Probabilities to Estimate Transmitted Signal

FIG. 8

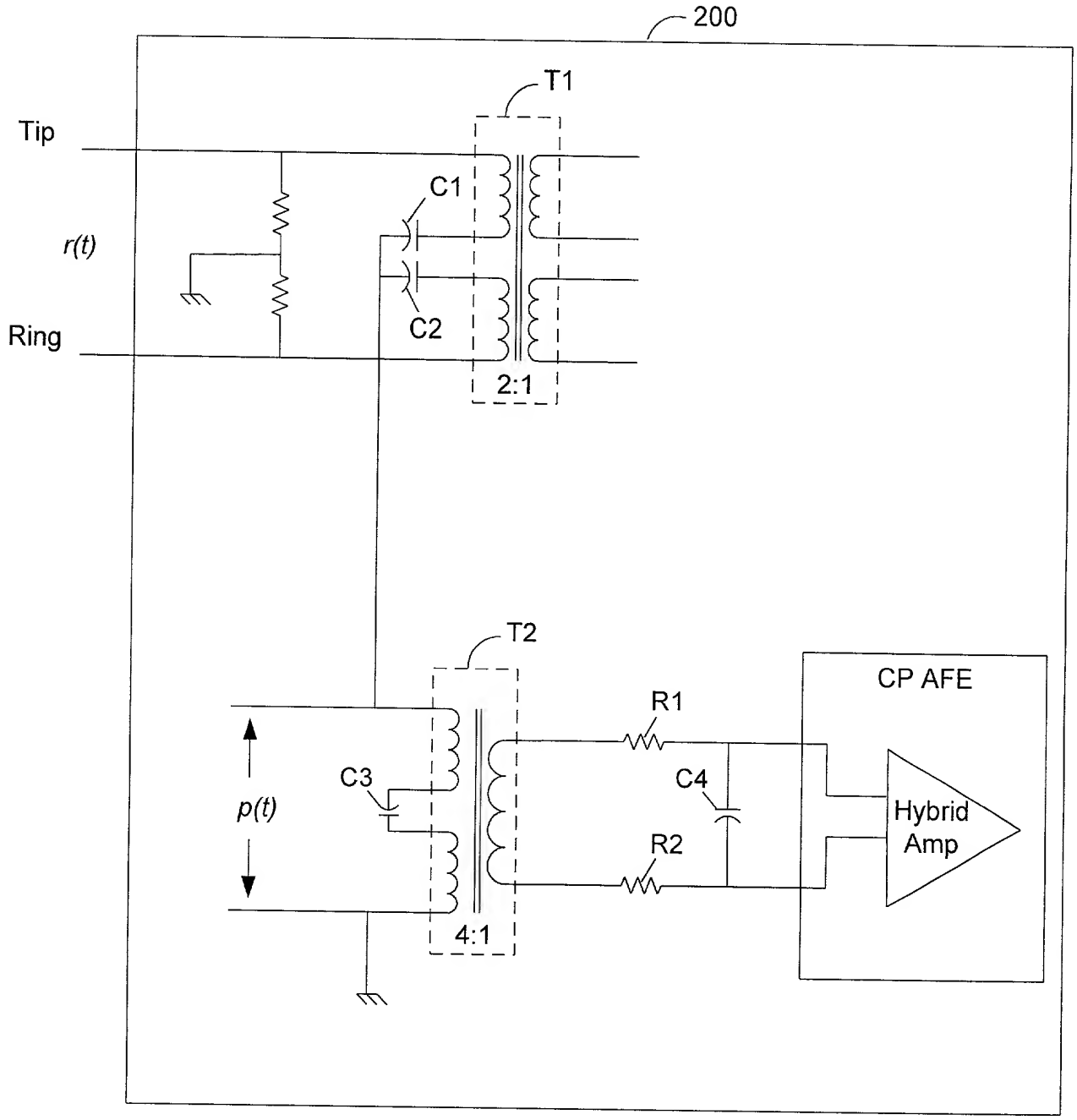

FIG. 9